QUIZ #2

Name:_____

- 40 Minutes, No materials allowed. (Number) indicates weighting.

1. For each, indicate where data comes from. Provide the type of addressing mode. Assume that $[X] = 0200_{16}$. (**0.4**)

   a) LDAA #$2D. Data comes from byte following op code, immediate addressing

   b) LDAA $7C.   Data comes from address 007C, direct addressing

   c) LDAA $57BB. Data comes from address 57BB, extended addressing

   d) LDAA $3F, X. Data comes from address 023F, indexed addressing

2. Calculate the value of the offset byte portion of the BEQ instruction. (**1**)

   0373 (current [PC]) – 031D (new [PC]) = 0056.

   This result has to be 2's complemented to obtain

   the negative offset. The required offset byte is AA.

0370	START	10	SBA
0371		27 **??**	BEQ $031D
0373		97 50	STAA $50
0375	END	3E	WAI

3. Show how the JSR instruction can be replaced by a BSR instruction with appropriate offset. The op code for BSR is 8D. (**1**)

   BD C1 60   JSR $C160 -> 8D 5C   BSR $C160

C100	MAIN	96 A6	LDAA $A6
C102		BD C1 60	JSR $C160
C105		97 A7	STAA $A7
C107	END	3E	WAI
:	:	:	:
:	:	:	:
C160	SHIFT	44	LSRA
C161		44	LSRA
C162		39	RTS

4. When the MPU executes a (JSR), it saves the (return address) on the (stack), jumps to the (subroutine address), and executes the (subroutine). At the end of the (subroutine), the (RTS instruction) causes the MPU to take the (return address) off the (stack), place it back in the (PC), and continue execution of the main program. (**1**)

5. Describe two ways to halt execution of a program in MC68HC11. (**0.6**)

   WAI (Wait for Interrupt) and unconditional branch instruction, BRA

6. Consider the following instruction sequence. Determine where the program will branch to for each of the following values of unsigned data in memory location 0050. (**1.5**)

   (a) 95. C607 + FFD6(p. 323) = C5DD

   (b) B7. C609 + 55 = C65E

   (c) E1. C60B + 6B = C676

C600	START	96 50	LDAA $50
C602		43	COMA
C603		81 48	CMPA #$48
C605		22 D6	BHI $????
C607		27 55	BEQ $????
C609		20 6B	BRA $????

THE END

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